

美格信蓝牙Dongle U987Q

指令集V1.5

MegaSig BT Dongle U987Q

CMD List V1.5

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从此文件发布日期起，在此发表的是当前或者拟定的信息。由于我们会不断对产品进行改进和增加特征此出版物中的信息如有变动恕不另行通知。

The information presented herein reflects the current or intended specifications as of the date of publication. As we continuously improve our products and add new features, the contents of this publication are subject to change without prior notice.

串口通信参数:	
Baud Rate:	921600 (U987Q 默认该采样率)
Data Bits :	8
Parity :	None
Stop Bits:	1.0
Flow Control:	None
Termination Char:	\n

蓝牙指令：

注：下表中 ‘\r\n’代表回车换行，Hex 为 0D0A，备注有“记忆”两字代表指令设置一次便可一直有效（升级固件后设置将会重置）。

名称	发送	反馈	备注
987模式设置（记忆）	>MODE_SET=1\r\n >MODE_SET=2\r\n >MODE_SET=4\r\n	OK	1代表WDM输入模式 (需要解锁高通驱动) 2代表Shuttle模式 4代表模拟输入模式 (默认为shuttle)
读取固件属性	>SYS_INFO_GET=?\r\n	>SYS_INFO_GET= MegaSig U987 FirmwareV3.1.1-09	内容包括型号和固件版本
设置987的搜索模式（记忆）	>SET_SEARCH_MODE=1 >SET_SEARCH_MODE=2 >SET_SEARCH_MODE=3	SEARCH BREDR Or SEARCH LE_AUDIO Or SEARCH DUAL	1:只搜索经典蓝牙 2:只搜索LEA地址 3:两个地址同时搜索 (默认为3) 可以有效加快搜索速度。
获取987搜索模式	>GET_SEARCH_MODE=?	DUAL MODE	获取当前dongle搜索模式 (这两个指令在3.1.1-16版本之后支持)
BT连接			
通过蓝牙地址码连接被测物	>CONN=28371317B0E4\r\n	Waiting Connect Waiting Connect DEVICE=1C52166B43 6E NAME= QCY- QY19 APTX A2DP	连接成功后，默认打开A2DP，打通Speaker的通路
打开A2DP	>OPEN A2DP\r\n	OK PAIREDA2DP	自动关闭HFP，打通Speaker的通路

打开 HFP	>OPEN HFP\r\n	OK PAIREDHFP mSBC 16k or CVSD 8k or APT-X Voice 32K	1) 自动关闭 A2DP, 打通麦克风的通路; 2) mSBC 代表产品支持宽带; 3) CVSD 代表产品仅支持窄带 4) APT-X Voice代表产品仅支持高通独有32k采样率
断开连接 Disconnect	>DISC\r\n	OK IDLE	需断开已有蓝牙连接, 才能进行下一次连接
重置连接板Reset	>RST\r\n	OK IDLE	
搜索蓝牙地址 Search	>SEARCH=5\r\n	DEVICE=1C52166B436E RSSI=-76 NAME=QCY-QY19 CLASS=240414	搜索到周围的蓝牙地址为“1C52166B436E”、RSSI 强度值、耳机名称、耳机 COD 类型
停止搜索	>SEARCH STOP\r\n	OK	一旦开启搜索, 需发送停止搜索指令
查询当前状态	>STATUS\r\n	IDLE Or PAIRED A2DP Or PAIRED HFP	
开始读取 RSSI	>START RSSI UPLOAD\r\n	RSSI=-73	返回 RSSI 值
停止读取 RSSI	>STOP RSSI UPLOAD\r\n	OK	
设置默认音量 (后两位是音量大小, 最大为15) (记忆)	>A2DP_DEFAULT_VOL=15\r\n	OK	设置默认音量后, 需要发送 Reset 指令, 或者对设备进行断电重启
设置搜索时的 COD (记忆)	>COD_SET=000400\r\n	OK	改变COD 的值, 将对蓝牙设备搜索范围进行限定, 不建议修改

获取已设置的COD	>COD_GET=?\r\n	>COD_GET=000400	
自动搜索并连接	>NO_MAC_CON\r\n	Waiting Connect Waiting Connect DEVICE=1C52166B436E NAME= QCY-QY19 APT X A2DP	不需要通过地址码进行连接，当同时开启的耳机数量较多时，容易误连，建议使用屏蔽箱
通过蓝牙地址码连接被测物，并开始SPP通讯	>SPP_CONN=00025B00A5A5\r\n	REMOTE_CHANNEL [1 2] CONN_CHANNEL[1] >SPP_PENDING >SPP_CONNECT	地址码要大写
查询当前SPP Remote Channel	>SPP_CH_GET=?\r\n	>SPP_CH_GET=2\r\n	代表当前 Remote Channel 为 2
SPP 连接之前设置SPP Remote Channel（记忆）	>SPP_CH_SET=4\r\n or >SPP_CH_SET=-1\r\n	OK	1) 设置 dongle 的SPP 通道，范围为 0-99；设置后自动记忆保存，下次使用同一个 Channel号可不用重复设置； 2) 可设置端口号为-1，表示连接获取耳机SPP的第一个通道。
通过SPP向被测物发送信息	>SPP_SEND=发送数据		可不需加“>SPP_SEND=”直接发送数据透传
获取被测物通过SPP发送的信息		>SPP_RECV= 上 报 数 据	接收的过程是被动的，需要实时监测串口内的数据； 如使用 U987，其回复内容为透传无 “>SPP_RECV=”

自定义设置SPP UUID	>SPP_CH_SET=-5,CH,UUID	OK or ERROR	1) CH需为两位数, -1代表跟随耳机通道, 05代表连接5号通道; 2) UUID需为32位数, 譬如可设置为标准的0000110100001000800000805F9B34FB; 设置后不记忆保存, DISC后恢复默认, 即需每次SPP连接前设置; 3) dongle新版本支持自定义16个字节的UUID和SPP通道设置 4) 举例: 发 >SPP_CH_SET=-5,-1,0000110100001000800000805F9B34FB 代表表设置标准UUID且SPP通道跟着耳机;
连接后设置 Speaker 音量	>SET_VOL=10\r\n	OK	音量需为两位数字 00-15
连接后设置 Mic 音量	>MIC_GAIN=15\r\n	OK	音量需为两位数字 00-15, 默认设置为 10, 放大一倍
获取已连接的蓝牙产品名称和地址	>GET_CONN_INFO\r\n	DEVICE=1C52166B436E NAME= QCY-QY19	蓝牙连接成功后, 该指令才有效
获取连接编码	>GET A2DP\r\n	APT X A2DP	蓝牙连接成功后, 该指令才有效
重置A2DP音频, 获取A2DP编码采样率	>A2DP_AUDIO_RESET\r\n	SUSPEND_OK RESUME_OK SAMPLE_RATE=48000	蓝牙连接成功后, 该指令才有效
设置音频流的打开或者关闭	>AUDIO_SET=0\r\n	AUDIO_SUSPEND	0:断开所有音频流 1:打开所有音频流 2:断开A2DP音频流 3:打开A2DP音频流 4:重启A2DP音频流

			5:断开HFP音频流 6:打开HFP音频流 7:重启HFP音频流 8:模拟手机按下暂停键
获取Link Key	>GET_CUR_LINK_KEY\r\n	LINK_KEY=567023c1a4b958373dfd291b9371b861	蓝牙连接成功后，该指令才有效；
发送 HFP AT 指令	>AT_CMD= AT+NTC=?\r\n	AT+NTC=1,180	1) 蓝牙连接成功后，该指令才有效；
获取已使能或关闭的连接协议	>PROFILE_GET=X\r\n	A2DP ENABLED/DISABLED Or HFP ENABLED/DISABLED Or AVRCP ENABLED/DISABLED	X 可为 0-2 ， 分别代表 A2DP/HFP/AVRCP 协议的状态
启用或者关闭需连接的协议（记忆）	>PROFILE_SET=X&S\r\n	DISABLE/ENABLE A2DP Or DISABLE/ENABLE HFP Or DISABLE/ENABLE AVRCP	X 可为 0-2 ， 分别代表 A2DP/HFP/AVRCP 协议； S 可为0或者1，分别代表关闭或者启用
发送 AVRCP命令	>AVRCP_CMD_SET=DATA	AVRCP_SUCCESS	1)发送AVRCP PASSTHROUGH 指令给产品； 2)DATA 需为十六进制命令，且不能多于12个字节；

获取更新的电量值	>BATT\r\n	BAT=7 Or POWER=68	1) 获取更新的电量值； 正常情况，电量在第一次连接成功后上报； 2)BAT是大致电量，有9格，例如”7”代表大概80%的电量。POWER则是具体电量；
模拟手机来电	>MAKE CALL\r\n	OK	
模拟手机接听	>ANSWER CALL\r\n	OK	
模拟手机挂断	>CANCEL CALL\r\n	OK	
设置HFP窄带模式（U987）（记忆）	>mSBC_ENABLED=x\r\n	OK	1) 每一次连接蓝牙之前需发送这条指令； 2) 断开蓝牙连接后该指令继续，默认宽带优先，除非设备不支持 x可以为1,2,3 1代表CVSD，走8k采样率 2代表mSBC，走16k采样率 （默认） 3代表 APTX Voice，高通特有，走32k采样率
设置连接PIN码	>SET_PIN=1234\r\n	SET_4PIN	连接需要pin码可以用此指令设置，最高支持到16位pin码 注意：此指令没有记忆保存，每次连接之前都需设置
获取连接的PIN码	>GET_PIN=?\r\n	PIN=1234	获取设置的pin码
设置avrcp版本号（记忆）	>AVRCP_VER_SET=0\r\n	>SET_VER=1.6\r\n	0:1.6 1:1.5 2:1.4 3:1.3

获取avrcp版本号	>AVRCP_VER_GET=?\r\n	>AVRCP_VER_GET=1.6\r\n	
设置波特率（记忆）	>BAUD_RATE_SET=3\r\n	OK	0:115200 5:2000000 1:230400 2:460800 3:921600 4:1382400
获取波特率	>BAUD_RATE_GET=?\r\n	>BAUD_RATE_GET=921600\r\n	
设置音质（记忆）	>SET_CODEC_INFO=1&1\r\n	AAC_ENBALE=1\r\n	0:SBC 1:AAC 2:APTX 3:APTX Adaptive 4:APTX HD 5:LDAC 6:LHDC 后缀分别是0（关闭）和1（开启） 例 如>SET_CODEC_INFO=5&1就代表打开LDAC编码 7:SBC 8:AAC 9:APTX 10:APTX Adaptive 11:APTX HD 12:LDAC 13:LHDC 后缀则是对应采样率，例如 如 >SET_CODEC_INFO=8&2，2是16进制数，对应二进制为0010，48k对应最后一个数字0，代表不启用，44.1k对应第三位1，代表启用，这样就可以开启AAC的44.1k采样率 注意：APTX和APTX HD只支持48k和44.1k APTX Adaptive支持99.6k和48k和44.1k 14:src 的声道设置（原理

			同上) 当设置成>SET_CODEC_INFO=14&F\r\n Joint Stereo: 1 Stereo:1 Dual Channel:1 Mono:1 15:音质先后顺序 >SET_CODEC_INFO=15&7&6&5&4&3&2&1\r\n SBC\AAC\APTX\APTX Adaptive\APTXHD\LDAC\ LHDC is 7\6\5\4\3\2\1
设置LDAC的码率	>LDAC_BITRATE=0\r\n	LDAC HQ(990kbps)	范围为0到2,0对应990kbps, 1对应660kbps, 2对应330kbps。默认码率为330kbps。
设置LHDC码率	>LHDC_BITRATE=0\r\n	LHDC HIGH(900kbps)	范围为0到2,0对应900kbps, 1对应500kbps, 2对应400kbps。默认码率为400kbps。

LE AUDIO连接

通过蓝牙地址与 LE AUDIO 连接	>LE_CONN=28371317B0E4\r\n	DEVICE=1C52166B436E NAME=QCY-QY19	一旦配对了LE Audio的耳机, CCP 和 MCP 也将自动连接。
设置连接耳机的类型 (记忆)	>SET_LEACONN_MODE=1\r\n	HEADSET CONN Or TWS CONN	1为headset类型耳机, 代表对应一个蓝牙地址, 可连接头戴式耳机或者TWS单耳。 2为双耳模式, 如果TWS耳机为两个地址码, 选择这个可以实现双耳连接。(此指令除高通耳机外使用)
通过 AURAC	>OPEN_AURACAST\r\n	OK	禁用单播频道, 自动连接广播频道 (未有lea连

AST播放声音 (记忆)			接的情况下，放歌并打开广播模式，耳机是可以通过广播主动连接到 Dongle的) 如果是以前版本，开启 AURACAST的指令是 >OPEN BROADCAST\r\n
关闭 AURACAST (记忆)	>CLOSE_AURACAST\r\n	OK	关闭广播频道，自动连接单播音频频道
断开连接	>DISC\r\n	OK SYS_START IDLE	在连接下一个 DUT 之前，应断开当前连接断开（同经典蓝牙）
重置 dongle	>RST\r\n	OK SYS_START IDLE	设备重新上电启动。（同经典蓝牙）
搜索 LE AUDIO 地址	>SEARCH=5\r\n	LE DEVICE=1C52166B436E RSSI=-76 NAME=QCY-QY19 ADV_SID=0xf	LE 地址为“1C52166B436E”，并获取设备的 RSSI\DUT 名称/Advertisement
关闭搜索	>SEARCH STOP\r\n	OK	
获取连接的配置文件状态	>CHECK_MODE\r\n	IDLE Or Broadcast Mode Or Unicast LC3 Mode Or Unicast Gaming Mode	IDLE 表示加密狗已为即将到来的连接初始化；广播模式表示加密狗处于广播状态，可以有无限的耳机连接加密狗单播LC3模式表示加密狗处于单播状态，编码为 LC3。 单播游戏模式表示加密狗处于单播游戏低延迟状态，编码为 APTX LITE（高通）。
打开le audio 音频	>OPEN LEA\r\n	LE AUDIO START	打开le audio的音乐模式，连上默认打开（3.1.1-13之后的版本支持）
打开le audio 语音	>OPEN LEV\r\n	LE VOICE START LC3 VOICE:32000	打开le audio的语音模式（3.1.1-13之后的版本支持）
开始音频流	>START_AUDIO_STREAM\r\n	OK	

停止播放音频流	>STOP_AUDIO_STREAM\ r\n	OK	
设置 UNICAST 音量（最大值为 100）	>SET_UNICAST_VOL=100 \r\n	OK	可为单播设置音量（0-15）
设置广播 id（记忆）	>SET_BROADCAST_ID=0001234\r\n	OK	广播 id 是耳机与加密狗连接的必要参数，如果不更改，它将是默认的随机 id（建议更改 6 位及以下数字，如果更改 8 位数字，在耳麦侧只能看到最后 6 位数字）。
获取广播 id	>GET_BROADCAST_ID=?\r\n	broadcast_id:0x00001234	
自动搜索和连接	>LE_NO_MAC_CON\r\n	Waiting Connect Waiting Connect DEVICE=1C52166B436E NAME=QCY-QY19 APTX A2DP	建议使用屏蔽盒，以避免错误连接其他 DUT
设置 advertisement id（记忆）	>SET_ADV_SID=e\r\n	OK	设置广告 ID。范围 0-f（十六进制）。也是连接加密狗广播的参数。默认为 0xf。
获取 advertisement id	>GET_ADV_SID=?\r\n	ADV_SID=0xe	
设置 dongle 广播名称（记忆）	>SET_BROADCAST_NAME=Broadcastff01\r\n	OK	设置 dongle 端广播名称。最大字符数不能超过 30。

获取dongle广播名称。	>GET_BROADCAST_NAME=?\r\n	Broadcastff01	默认名称为Broadcast+lap
开始游戏模式	>OPEN_GAME_MODE\r\n	GAME MODE OPEN	在该模式下，音质为 LC3 加强版，延迟更低，如果耳机为高通耳机，可以使用 APTX_LITE,延迟可达到20ms 上行采样率为16KHZ 下行采样率为48KHZ
关闭游戏模式	>CLOSE_GAME_MODE\r\n	GAME MODE CLOSE	在该模式下，音质为 LC3。 (如果耳机不为高通，播放声音异常，可以尝试开启或者关闭游戏模式，声音就会恢复正常) 上行下行采样率一样，最高为32KHZ
设置广播密码（记忆）	>SET_BROADCAST_CODE=123456789\r\n	OK	最大长度16位，可设置LEA广播密钥
获取广播密码	>GET_BROADCAST_CODE=?\r\n	BROADCAST_CODE=12345678	

BLE协议连接

搜取BLE地址	>BLE_SEARCH\r\n	BLE DEVICE=648FDB5D94 19 RSSI=-59 NAME=Xiaomi Buds 5	搜索ble地址
停止搜索BLE地址	>BLE_SEARCH_STOP\r\n	OK	停止搜索ble地址
设置搜索的rssi	>BLE_SEARCH_RSSI=-60\r\n	OK	设置搜索rssi

BLE设备连接	>BLE_CONN=0_E59314A64EA8\r\n	BLE Connecting... Connected:E59314A64EA8 MTU = 124	连接地址，下划线前 0: Public地址 1: Random地址
断开BLE设备	>BLE_DISC\r\n	BLE Disconnect	断开BLE地址
设置MTU长度	>BLE_SET_MTU=512\r\n	OK	设置MTU值，在设备连接之前设置才能生效。
设置PHY的长度	>BLE_SET_PHY=0x03,0x03,0x4,0x4\r\n	PHY Tx:1 Rx:2	参数解释 1: TX min 2: TX max 3: RX min 4: RX max 参数设置 MIN ((uint8_t) 0x00) 125K ((uint8_t) 0x01) 500K ((uint8_t) 0x02) 1M ((uint8_t) 0x03) 2M ((uint8_t) 0x04) QHS ((uint8_t) 0x05) MAX ((uint8_t) 0xff)
获取PHY的长度	>BLE_GET_PHY\r\n	PHY Tx:1 Rx:2	
获取服务UUID	>BLE_GET_SERV=?\r\n	UUID:0xFE59 Service:0x7_0xf	获取该设备下所有的服务
获取特征值	>BLE_GET_CHAR=0x7_0xf\r\n	Handle:9 UUID:0xEA50 ,WRITE ,NOTIFY	获取某一个服务下的具体特征信息，0x7_0xf则是具体范围。如果发送这个>BLE_GET_CHAR=?指令，则获取所有服务下所有特征
打开Notify	>BLE_ENABLE_NOTIFY=10\r\n	OK	打开具体特征下的notify功能，对应的数值就是handle的值，不过需要加一

读取特征信息	>BLE_READ_CHAR=14\r\n	Value_Size:0 Value:	读取具体特征值的信息，前提是特征信息得是“READ”
向特征值写入request	>BLE_WRITE_REQ=3_CTXXAT^MODE?\r\n	Received_Size:20 Data:TCXXAT^MODE=FACTORY	
向特征值写入command	>BLE_WRITE_CMD=3_CTXXAT^MODE?\r\n	Received_Size:20 Data:TCXXAT^MODE=FACTORY	打开notify之后，大概率需要这个特征写入
获取连接之后的RSSI	>BLE_GET_RSSI=?\r\n	RSSI:-68	
开始BLE广播（服务端）	>BLE_ADV_START\r\n	OK	开始BLE广播,也可以发送指令 >BLE_ADV_START=0x20,0x150\r\n 后面两个参数对应延迟关系对应 $150 \div 0.625 = 240\text{ms}$ (广播名称为MEGASIG U987)
停止BLE广播（服务端）	>BLE_ADV_STOP\r\n	OK	
向服务对端设备发送数据	>BLE_ADV_WRITE=11\r\n	OK	对端设备得打开notify才能接收成功。然后其他特征值都有对应处理

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Serial Port Parameter:	
Baud Rate:	921600 (U987Q Defaults to this sample rate)
Data Bits :	8
Parity :	None
Stop Bits:	1.0
Flow Control:	None
Termination Char:	\n

Notice:

‘\s’ means blank, equals to 0x20,

‘\r\n’ means return and line break, equals to 0x0D0A.

The word “Memory” means that the command will be valid once it has been set (the setting will be reset after upgrading the firmware).

Item	Send	Receive	Notice
987 Mode Setting (memory)	>MODE_SET=1\r\n >MODE_SET=2\r\n >MODE_SET=4\r\n	OK	1 for USB input mode (Need to unlock Qualcomm drivers) 2 for Shuttle mode 4 for analogue input mode (defaults to shuttle)
Read hardware attributes	>SYS_INFO_GET=?\r\n	>SYS_INFO_GET=M egaSig U987 FirmwareV3.1.1-10	This indicates the firmware version number of the U987
Setting the search mode of the 987 (memory)	>SET_SEARCH_MODE=1 >SET_SEARCH_MODE=2 >SET_SEARCH_MODE=3	SEARCH BREDR Or SEARCH LE_AUDIO Or SEARCH DUAL	1:Only search classic bluetooth 2:Only search LEA address 3:Search both addresses at the same time (Default is 3) It can effectively speed up the search.
Get 987 search pattern	>GET_SEARCH_MODE=?	DUAL MODE	Get the current dongle search pattern (these two commands are supported after version 3.1.1-16)
BT Connection			
Connect by BT address	>CONN=28371317B0E4\r\n	Waiting Connect Waiting Connect DEVICE=1C52166B436E NAME=QCY-QY19	1)Address code needs to be capitalized; 2)When the connection is successful, A2DP and the channel of the Speaker will be opened acquiescently.

Open A2DP	>OPEN A2DP\r\n	OK PAIREDA2DP	Close HFP mode,the channel of the Speaker will be opened.
Open HFP	>OPEN HFP\r\n	OK PAIREDHFP mSBC 16k or CVSD 8k or APT-X Voice 32K	1) Close A2DP mode,the channel of the Mic will be opened 2) mSBC represent the DUT support wideband speech 3) CVSD represent the DUT only support narrowband speech
Disconnect	>DISC\r\n	OK IDLE	Before connecting next DUT,the current connection should be disconnected
Reset the dongle	>RST\r\n	OK IDLE	
Search BT address	>SEARCH=5\r\n	DEVICE=1C5266B436E RSSI=-76 NAME=QCYQY19 CLASS=240414	BT address is “1C52166B436E”, and get the RSSI\DUT Name\Class of Device
Stop Search	>SEARCH STOP\r\n	OK	
Get connected profile status	>STATUS\r\n	IDLE Or PAIREDA2DP Or PAIREDHFP	IDLE means dongle had been initialized for the coming connection; PAIREDA2DP means dongle had connected the DUT,and in A2DP status; PAIREDHFP means dongle had connected the DUT,and in HFP status
Start to get RSSI	>START RSSI UPLOAD\r\n	RSSI=-73 RSSI=-73	
Stop to get RSSI	>STOP RSSI UPLOAD\r\n	OK	
Set default volume (vol should be two digits,and the maximum value is 15) (memory)	>A2DP_DEFAULT_VOL =15\r\n	OK	After setting the default volume, the device needs to be powered off and restarted or send the Reset command
Set the COD during the search (memory)	>COD_SET=000400\r\n	OK	Changing the value of COD will limit the search range of bluetooth device, and it is not recommended to modify.

Get the COD	>COD_GET=?\r\n	>COD_GET=000400	
Automaticall y search and connect	>NO_MAC_CON\r\n	Waiting Connect Waiting Connect DEVICE=1C52166B43 6E NAME=QCY- QY19	Recommend to use shielding box to avoid connecting other DUT by mistake
Simulate calling the headset	>MAKE CALL\r\n	OK	Simulate calling the headset
Connect to the subject via bluetooth address code and start SPP communicati on	>SPP_CONN=1C52166 B436E \r\n	REMOTE_CHANNEL [1 2] CONN_CHANNEL[1] >SPP_PENDING >SPP_CONNECT	
Query the current SPP Remote Channel	>SPP_CH_GET=?\r\n	>SPP_CH_GET=2\r \n	represents the current Remote Channel is 2.
Setting up SPP before SPP connection Remote Channel (memory)	>SPP_CH_SET= 4\r\n or >SPP_CH_SET= -1\r\n	OK	1)Set the SPP channel of dongle, the range is 0-99; after setting, it will be saved in memory automatically, so that the same channel number can be used next time without repeating the setting; 2) The port number can be set to -1, which means connecting to the first channel to get the SPP of the headset.
Send information to the object via SPP	>SPP_SEND=DATA		If you want to send out large packets of data or hexadecimal data, '>SPP_SEND=' can be ignored and the data can be sent directly.

Gets the information sent by the measured object through SPP		>SPP_RECV=DATA	The receiving process is passive and requires real-time monitoring of data in the serial port; If use U987,">SPP_RECV =" will be ignored,and the DATA can be received directly
Set Speaker volume after connection	>SET_VOL=05\r\n	OK	Volume should be two digits (00-15)
Get connected Device&Name	>GET_CONN_INFO\r\n	DEVICE=1C52166B436E NAME= QCY-QY19	This cmd will work after the successful BT connection
Get the connected codec	>GET_A2DP\r\n	APT_X A2DP	This cmd will work after the successful BT connection
Reset A2DP audio and get A2DP codec sample rate	>A2DP_AUDIO_RESET\r\n	SUSPEND_OK RESUME_OK SAMPLE_RATE=48000	This cmd will work after the successful BT connection
Setting the audio stream on or off	>AUDIO_SET=0\r\n	AUDIO_SUSPEND	0:Disconnect all audio streams 1:Open all audio streams 2:Disconnect A2DP audio streams 3:Open A2DP audio streaming 4:Restart A2DP audio streaming 5:Disconnect HFP audio flow 6:Open HFP audio stream 7:Restart HFP audio streaming 8:Simulate mobile phone pressing pause button
Get the BT Link Key	>GET_CUR_LINK_KEY\r\n	LINK_KEY=567023c1a4b958373dfd291b9371b861	This cmd will work after the successful BT connection
Send the HFP AT Cmd	>AT_CMD=AT+NTC=?	AT+NTC=1,180	This cmd will work after the successful BT connection

Get the enabled or disabled profile	>PROFILE_GET=X\r\n	A2DP ENABLED/DISABLED Or HFP ENABLED/DISABLED Or AVRCP ENABLED/DISABLED	X can be 0-2, represent A2DP/HFP/AVRCP profile status;
Set the enabled or disabled profile (memory)	>PROFILE_SET=X&S\r\n	DISABLE/ENABLE A2DP Or DISABLE/ENABLE HFP Or DISABLE/ENABLE AVRCP	X can be 0-2, represent A2DP/HFP/AVRCP profile; S can be 0 or 1, represent the disable or enable function;
Setting the baud rate (memory)	>BAUD_RATE_SET=3\r\n	OK	0:115200 1:230400 2:460800 3:921600 4:1382400 5:2000000
Get baud rate	>BAUD_RATE_GET=?\r\n	>BAUD_RATE_GET=921600\r\n	
Setting the avrcp version number (memory)	>AVRCP_VER_SET=0\r\n	>SET_VER=1.6\r\n	0:1.6 1:1.5 2:1.4 3:1.3
Get avrcp version number	>AVRCP_VER_GET=?\r\n	>AVRCP_VER_GET=1.6\r\n	
Send the AVRCP Command	>AVRCP_CMD_SET=DATA	AVRCP_SUCCESS	1) Send the AVRCP PASSTHROUGH command to DUT; 2) DATA should be hex command and less than 12 bytes;

Get updated battery	>BATT	BAT=7 Or POWER=68	1) Normally, the battery can be get from first successful connection if DUT support; 2) BAT is the approximate power level, there are 9 frames, for example, "7" means about 80% of the power level, POWER is the specific power level;
Set HFP narrowband mode (memory)	>mSBC_ENABLED=X\r\n	OK	1) This command must be send before connect the DUT every time. 2) After disconnect the DUT, this command will be invalid, and the wideband speech is preferred. unless DUT no support X can be 1,2,3. 1 for CVSD, going to 8k sample rate 2 for mSBC, go to 16k sample rate (default) 3 for APTX Voice, Qualcomm specific, 32k sample rate.
Setting the Connection PIN	>SET_PIN=1234\r\n	SET_4PIN	Connections need pin code can be set with this command, the highest support to 16-bit pin code Note: This command has no memory, you need to set it before each connection.
Get the PIN code for the connection	>GET_PIN=?\r\n	PIN=1234	Get the set pin code
Simulate a mobile phone call	>MAKE CALL\r\n	OK	
Simulate mobile phone answering	>ANSWER CALL\r\n	OK	
Simulate mobile phone hang-up	>CANCEL CALL\r\n	OK	

Setting the audio encoding (memory)	>SET_CODEC_INFO=1&1\r\n	AAC_ENBALE=1\r\n	0:SBC 1:AAC 2:APTX 3:APTX Adaptive 4:APTX HD 5:LDAC 6:LHDC The suffixes are 0 (off) and 1 (on) respectively For example, >SET_CODEC_INFO=5&1 means to turn on LDAC encoding 7:SBC 8:AAC 9:APTX 10:APTX Adaptive 11:APTX HD 12:LDAC 13:LHDC The suffix is the corresponding sampling rate, for example >SET_CODEC_INFO=8&2, 2 is a hexadecimal number, corresponding to binary 0010, 48k corresponds to the last digit 0, which means not enabled, and 44.1k corresponds to the third digit 1, which means enabled, so you can turn on the aac's 44.1k sampling rate. Note: APTX and APTX HD only support 48k and 44.1k. APTX Adaptive supports 99.6k and 48k and 44.1k. 14: Channel setting for SBC (same principle as above) When set to >SET_CODEC_INFO=14&F\r\n Joint Stereo: 1 Stereo: 1 Dual Channel: 1 Mono: 1 15: Audio Sequence >SET_CODEC_INFO=15&7&6&5&4&3&2&1\r\n SBC\AAC\APTX\APTX Adaptive\APTXHD\LDAC\LHDC is 7\6\5\4\3\2\1
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Setting the LDAC bit rate	>LDAC_BITRATE=0\r\n	LDAC HQ(990kbps)	The range is 0 to 2. 0 corresponds to 990kbps,1 corresponds to 660kbps,2 corresponds to 330kbps.The default code rate is 330kbps.
Setting the LHDC bit rate	>LHDC_BITRATE=0\r\n	LHDC HIGH(900kbps)	The range is 0 to 2. 0 corresponds to 900kbps,1 corresponds to 500kbps,2 corresponds to 400kbps.The default code rate is 400kbps.

LE AUDIO Connection

Connection to LE AUDIO via Bluetooth address	>LE_CONN=28371317B0E4\r\n	DEVICE=1C52166B436E NAME=QCY-QY19	Once le audio is connected, CCP and MCP will also be connected automatically.
Open lea audio	>OPEN LEA\r\n	LE AUDIO START	Turn on le audio music mode, connect to turn it on by default (Supported by versions after 3.1.1-13)
Open lea voice	>OPEN LEV\r\n	LE VOICE START LC3 VOICE:32000	Turn on le audio's voice mode (supported in versions after 3.1.1-13)
Setting the type of headset to be connected (memory)	>SET_LEACONN_MODE=1\r\n	HEADSET CONN or TWS CONN	1 for headset type headphones, represents corresponding to a Bluetooth address, can be connected to the headset or TWS monaural. 2 for binaural mode, if TWS headset is two address codes, select this to achieve binaural connection. (Except Qualcomm headset)
Open BROADCAST (memory)	>OPEN_BROADCAST\r\n	OK	Disable unicast channels and automatically connect to broadcast channels

Playing sound through AURACAST (memory)	>OPEN_AURACAST\r\n	OK	and >OPEN_BROADCAST\r\n mean the same thing, but the name of the command was changed, in the latest U987 version (after 3.1.1-13)
Close BROADCAST (memory)	>CLOSE_BROADCAST\r\n	OK	Turns off broadcast channels and automatically connects unicast high-quality audio channels
Disconnect	>DISC\r\n	OK SYS_START IDLE	Before connecting next DUT.the current connection should be disconnected
Reset the dongle	>RST\r\n	OK SYS_START IDLE	
Search BT address	>SEARCH=5\r\n	LE DEVICE=1C52166B436E RSSI=-76 NAME=QCY-QY19 ADV_SID=0xf	LE address is “1C52166B436E”, and get the RSSI DUT Name\Advertisement of Device
Stop Search	>SEARCH STOP\r\n	OK	
Get connected profile status	>CHECK_MODE\r\n	IDLE Or Broadcast Mode Or Unicast High Quality Mode Or Unicast Gaming Mode	IDLE means dongle had been initialized for the coming connection; Broadcast Mode means The dongle is in broadcast state and can have unlimited connections dongle Unicast High Quality Mode means. The dongle is in unicast state, encoded as APTX Unicast Gaming Mode means The dongle is in a unicast game low latency state, encoded as LC3
Start to audio stream	>START_AUDIO_STREAM\r\n	OK	
Stop to audio stream	>STOP_AUDIO_STREAM\r\n	OK	
Set UNICAST volume (the maximum value is 100)	>SET_UNICAST_VOL=100\r\n	OK	Volume can be set for unicast (0-100)

Set the broadcast id(memory)	>SET_BROADCAST_ID=00001234\r\n	OK	The broadcast id is a necessary parameter for the headset to connect to the dongle, if you don't change it, it will be the default random id. (It is recommended to change 6 digits and below, if you change 8 digits, you can only see the last 6 digits on the headset side)
Get the broadcast id	>GET_BROADCAST_ID=?\r\n	broadcast_id:0x00001234	
Automatically search and connect	>LE_NO_MAC_CONNECTION\r\n	Waiting Connect Waiting Connect DEVICE=1C52166B 436E NAME=QCY-QY19 APTX A2DP	Recommend to use shielding box to avoid connecting other DUT by mistake
Set advertisement id (memory)	>SET_ADV_SID=0e\r\n	OK	Set advertisement id. range 0-f(hexadecimal). Also a parameter for connecting dongle broadcasts. Defaults to 0xf.
Get advertisement id	>GET_ADV_SID=?\r\n	adv_sid:0xe	
Check if it is set to PBP mode	>CHECK_PBP\r\n	PBP MODE Or TMAP MODE	
Setting the source broadcast name (memory)	>SET_BROADCAST_NAME=Broadcast\r\n	OK	Sets the source broadcast name. Maximum characters cannot exceed 30.
Get the source broadcast name.	>GET_BROADCAST_NAME=?\r\n	Broadcast	The default name is Broadcast+lap
Start LE AUDIO audio streaming	>START_AUDIO_STREAM\r\n	OK	

Pause LE AUDIO audio streaming	>STOP_AUDIO_STREAM\r\n	OK	
Setting the game mode in unicast	>OPEN_GAME_MODE\r\n	GAME MODE OPEN	In this mode, the sound quality is LC3 enhanced with lower latency. If the headset is a Qualcomm headset, you can use APTX_LITE, and the latency can be up to 20ms. Uplink sampling rate of 16KHZ Downstream sampling rate of 48KHZ
Close game mode Audio Mode	>CLOSE_GAME_MODE\r\n	GAME MODE CLOSE	In this mode, the sound quality is LC3 (If the headset is not Qualcomm and the playback sound is abnormal, you can try to turn on or off the game mode and the sound will be back to normal) Uplink and downlink sampling rate is the same, the highest is 32KHZ
Setting the broadcast password (memory)	>SET_BIS_CODE=12345678\r\n	OK	Maximum length 16 bits, LEA broadcast key can be set
Get the broadcast password	>GET_BIS_CODE=?	BROADCAST_CODE=12345678	

BLE Protocol Connection

Search for BLE address	>BLE_SEARCH\r\n	BLE DEVICE=648FD B5D9419 RSSI=-59 NAME=Xiaomi Buds 5	
Stop searching for BLE addresses	>BLE_SEARCH_STOP\r\n	OK	
Setting the rssi for searching	>BLE_SEARCH_RSSI=-60\r\n	OK	
BLE device connectivity	>BLE_CONN=0_E59314A64EA8\r\n	BLE Connecting... Connected:E59314A64EA8 MTU = 124	Connection address, before underscore 0: Public address 1: Random address

Disconnect the BLE device	>BLE_DISC\r\n	BLE Disconnect	
Set MTU length	>BLE_SET_MTU=512\r\n	OK	Set the MTU value and set it before the device is connected for it to take effect.
Set the length of the PHY	>BLE_SET_PHY=0x03,0x03,0x4,0x4\r\n	PHY Tx:1 Rx:2	Parameter explanation 1: TX min 2: TX max 3: RX min 4: RX max Parameter setting MIN ((uint8_t) 0x00) 125K ((uint8_t) 0x01) 500K ((uint8_t) 0x02) 1M ((uint8_t) 0x03) 2M ((uint8_t) 0x04) QHS ((uint8_t) 0x05) MAX ((uint8_t) 0xff)* /
Get the length of the PHY	>BLE_GET_PHY\r\n	PHY Tx:1 Rx:2	
Get Service UUID	>BLE_GET_SERV=?\r\n	UUID:0xFE59 Service:0x7_0xf	Get all services under this device
Get the characteristic	>BLE_GET_CHARACTERISTIC=0x7_0xf\r\n	Handle:9 UUID:0xEA50 ,WRITE ,NOTIFY	Get specific feature information under a particular service, and 0x7_0xf is the specific range. If you send this >BLE_GET_CHARACTERISTIC=? command, then get all features under all services
Open Notify	>BLE_ENABLE_NOTIFY=10\r\n	OK	Open the notify function under the specific feature, the corresponding value is the value of handle, but you need to add a
Read characteristic information	>BLE_READ_CHARACTERISTIC=14\r\n	Value_Size:0 Value:	Read information about a specific feature value, provided that the feature information is "READ".
Write characteristic information (request)	>BLE_WRITE_CHARACTERISTIC=3_CTXXAT^MODE?\r\n	Received_Size:20 Data:TCXXAT^MODE=FACTORY	

Write characteristic information (command)	>BLE_WRITE_C MD=3_CTXXAT^ MODE?\r\n	Received_Size:20 Data:TCXXAT^M ODE=FACTORY	
Getting RSSI after connection	>BLE_GET_RSSI =?\r\n	RSSI:-68	
Start ble broadcast (server-side)	>BLE_ADV_STA RT\r\n	OK	To start the BLE broadcast, you can also send the command >BLE_ADV_START= 0x20,0x150\r\n The last two parameters correspond to the delay The relationship corresponds to $150 \div 0.625 = 240\text{ms}$ (broadcast name is “MEGASIG U987”)
Stop ble broadcast (server-side)	>BLE_ADV_STO P\r\n	OK	
Send data to the service peer device	>BLE_ADV_WRI TE=11\r\n	OK	The device on the other end has to turn on notify in order to receive it successfully. Then all the other features are handled accordingly

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